

**REMARKS/ARGUMENTS**

Reconsideration of this application is respectfully requested.

In response to the Examiner's objection to the specification as being too lightly printed as originally filed, and in response to the Examiner's request, a newly printed copy of the entire specification is attached and labeled as a "Substitute Specification". The undersigned registered attorney of record hereby states that no new matter is included in this substitute specification.

In response to the Examiner's rejection of claims 1-6 under 35 U.S.C. §112, second paragraph, all claims have been amended in an effort to put them into more traditional US format and/or to obviate the Examiner's stated grounds for objection.

In light of other clarifying amendments, it is not believed that any further amendment or comment is necessary with respect to use of the words "respective" and "magnitude" since these words are clearly utilized in their ordinary sense and meaning when considered in the context of surrounding language.

The "respective node" is actually defined in the words that follow, that is to say it is the node having that child node. The claim requires each node at each level except the lowest two child nodes in the immediately lower level. Thus if you know a child node the respective node, i.e., the parent node for that child, is immediately defined.

In response to the Examiner's objection to the phrase "the highest available node", the wording has been slightly changed. The claim requires that the search pattern proceed such that all nodes at each level, beginning at the highest lever, are examined for availability before the search continues to the next lower level. The hardware engine will insert a new element at the first node which is found according to that search pattern and is thus determined to be available.

An amendment has been made to qualify what is meant by a "current node". It should in any event be plainly apparent from the description that "current node" is used to denote the node which is under examination at any given time.

Likewise, "current level" has been defined, in accordance with the disclosure, as the level at which the current node is located in the tree.

The term "magnitude" means what it says. An element which is being stored is, in essence, a digital word which has a magnitude. The search process at this point compares the magnitude of the new element with the magnitude of the element stored at the current node which is being examined.

A minor correction has also been made in claim 4, clause 1. Reference at this point should be to the current "node" not current "element". See, for example, search stage 121 in Figure 12.

The rejection of claims 1-6 under 35 U.S.C. §102 is allegedly anticipated by Sedgewick is respectfully traversed.

The present invention insures that each level is filled up when inserting values before one proceeds to the next level. This may be what Sedgewick describes as “level order traversal” – however applicant applies this to the insertion of nodes rather than the mere reading of nodes.

Level order searching, as taught by Sedgewick, involves searching the nodes at a given level before proceeding with a search at the next lower level. Sedgewick is not concerned with achieving a balanced tree by insertion of elements in nodes by means of a level order searching process. The quoted abstract from Sedgewick makes no reference to the insertion of nodes in this manner.

It is plainly apparent, for example, from Sedgewick Figure 1.42, that the search tree is not balanced by applicants’ claimed insertion method.

For example, if one examines the search tree in the top left-hand corner of Figure 4.12, the root node is occupied by value P, the two nodes in the next level are occupied by values M and L but only two nodes of the third level are occupied, see nodes occupied by values S and E. It will be observed that one child node each of nodes ‘M’ and ‘L’ have been left unoccupied. Therefore they have not been the subject of an insertion process which will fill up the nodes at a given level before the insertion process proceeds

to the next lower level. Likewise, the left-hand child node of node E is unoccupied notwithstanding that it is the same level as the two nodes denoted A and the node denoted R. All the child nodes of the two nodes A are left unoccupied while nodes at the same level, nodes T and E have a further development of the structure below them.

Therefore it is plainly apparent that Sedgewick does not extend the teaching of level order traversal to the insertion of nodes according to a pattern in which all the nodes in a given level are examined for availability and the first node which is available is selected for the insertion of a new element.

The purpose of the present invention was to implement a tree which is always balanced because every new element is inserted at the highest available node in the hierarchy. Clearly Sedgewick cannot possibly anticipate any of applicant's claims.

The rejection of claims 1-6 under 35 U.S.C. §103 as allegedly made "obvious" based on Bialkowski '777 in view of Sedgewick is also respectfully traversed.

Bialkowski does disclose a binary search tree which is organized in a multiplicity of levels. Bialkowski also further discloses a hardware engine for the insertion of elements in nodes of the tree. However, the control algorithm for this includes the features of assigning a weight to each node which is equal to the sum of the weights of each of the child nodes and thereafter balancing the binary tree structure whenever the weights associated with two child nodes of a common parent node differ by more than

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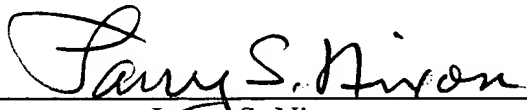
unity, Bialkowski, column 2, lines 16 to 22. The Examiner concedes that Bialkowski “does not teach searching in a pattern and in which all the nodes at each level beginning at the highest level are searched before the search continues to the next lower level”.

As earlier noted, Sedgewick is also fundamentally deficient and does not supply the admittedly missing features.

Accordingly, this entire application is now believed to be in allowable condition and a formal Notice to that effect is respectfully solicited.

Respectfully submitted,

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